

New Species of *Crocidium* and *Toxophora* (Bombyliidae).

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Subfam. BOMBYLIINAE (*Crocidium*-Group)

Gen. *Crocidium* Lw.

Loew, 1860, p. 195 ; Hesse, 1938, p. 786.

SINCE my revision of the known South African species of this genus in 1938 members of the South African Museum have collected quite a number of undescribed species in the Karoo, Namaqualand and Bushmanland, of which some are unfortunately represented only by single specimens. These various new forms are described below. As a result of these new discoveries some of the diagnostic characters of this genus, as accepted previously by Loew, Becker, Bezzi, Paramonow and myself, have to be modified. One of these characters concerns the eyes of the ♂♂ which in all the previously known species are in actual contact above for some distance, but which in one of the newly acquired forms (*dichopticum* n. sp.) are widely separated. The holoptic condition is therefore no longer a diagnostic character. The typically bell-shaped or subtriangular discoidal cell in the wings is also variable and in some of the new forms it is subspindle-shaped and even subacute apically. The position of the middle cross vein, which is usually near the apex of the discoidal cell, is also variable and in some species it is at or near the middle. The degree of the development of the spicules on the tibiae and that of the long apical spur on the middle ones is also variable ; some forms with unspotted wings have the spicules poorly developed or even scarcely detectable and the apical spur on middle tibiae much reduced. Another diagnostic character of species of *Crocidium*, not previously noticed, is the presence of a small knob-like or dentate process near apex on anterior face of the posterior coxae.

Crocidium microstictum n. sp.

A very distinct species with spotted wings which is characterized as follows :

Body mainly black, dull ; head and thorax usually densely covered with greyish white bloom, leaving two central stripes on disc of thorax to a little beyond the middle and a spot on each of these half-way between humeral angles and wing-bases, a broadish fascia on each side above wing-base as well as a spot on outside of this at level of wing-base dark, dark brownish to blackish

brown or black ; antennal segments 1 and 2 sometimes yellowish in part or even entirely yellowish ; the following parts pale yellowish or pallid : buccal rim, long basal joint of palps, humeral tubercle and anterior spiracular part, sclerites around base of wings, postalar callar ridge, hinder part or border of scutellum to a variable extent (more so in ♀), propleural sclerite above front coxae, especially in ♀, hind margin of metapleural part, infusions or spots below base of halteres, articulation between hypopleuron and hind coxae, broadish hind margins of tergites and sternites (sometimes very narrowly so in some ♂♂), entire or almost entire last tergite and sternite in ♀, to a variable extent apices of coxae, trochanters, extreme bases of femora, apical parts of femora and sometimes to a variable extent lower surface of hind femora in ♂ or sometimes greater part or entire femora in ♂, greater part or more usually entire femora in ♀, the tibiae and at least basal halves of tarsi in both sexes. *Vestiture* with the hairs not very dense, longer in ♂, especially on abdomen, mainly whitish, but those on thorax above in ♂ slightly more sericeous yellowish ; hairs on occiput, thorax and scutellum above and posteriorly on abdomen in ♀ distinctly deeper yellowish, tending to be more golden ; scaling on head above, thorax and abdomen above in ♀ even deeper yellowish, distinctly more golden ; scaling on abdomen above, even in ♂, more yellowish than whitish, even brassy yellowish ; scaling on legs in both sexes whitish to yellowish white, gleaming slightly more golden on tibiae. *Head* with the eyes in ♂ in contact above for a variable distance, from about subequal to to a little shorter than twice length of ocellar tubercle ; interocular space on vertex in ♀ about $2\frac{1}{2}$ to nearly 3 times width of ocellar tubercle ; frons in ♀ foveately and more centrally depressed near apical end ; face short, shorter than antennal joints 1 and 2 combined, not or scarcely raised medially ; antennal joint 1 about $2\frac{1}{3}$ – $3\frac{1}{3}$ times length of 2 ; joint 3 in ♀ conical, broadest near base, usually more rapidly narrowed below, not or scarcely curved, not distinctly humped, in typical ♂ appearing more parallel-sided to beyond middle ; proboscis short, stoutish, only about 0.68–1.2 mm. long ; palps relatively long, subequal in length to antennal joint 3. *Wings* subopaquely whitish, with dark brownish infuscations or spots on cross veins and at bases of third and second veins, at apex of costal cell, usually also at base of discoidal cell, and faintly at end of anal cell, the spots on apical cross veins of discoidal cell being more conspicuous and confluent ; all these spots much larger and more conspicuous and sometimes more confluent in ♀, and sometimes also a band-like infusion or fascia across base of second submarginal cell in ♀ ; ends of veins sometimes with indications of infusions, more so in ♀ ; veins more yellowish anteriorly and basally in unspotted parts ; second vein rather shortish, slightly undulating ; base of second submarginal cell subtruncate to distinctly rectangular and sometimes with a short stump ; discoidal cell wedge-shaped or subtriangular, with the middle cross vein much beyond its middle, at between apical third and apical fourth ; knobs of halteres entirely pallid or yellowish.

From 9 ♂♂ and 9 ♀♀ in the South African Museum.

Length of body : about 2.68–4.56 mm.

Length of wing about 2.68–4.56 mm.

Localities.—Western Cape in Olifants River Valley : Citrusdal Dist. (Mus. Exp., Nov. 1948) (types) ; Upper Sources of the Olifants River (Mus. Exp., Dec. 1949).

This species appears to be variable and, especially in the case of the ♂, occurs in what may be designated as a typical form and a colour form respectively. In the typical form of the ♂ the body has more yellowish, the first antennal joints, humeral tubercles, at least hinder part of scutellum, broadish hind margins of all the tergites, and apical halves or greater part or even entire femora are yellowish. In the colour form (♂) the antennae, humeral tubercles, entire scutellum, hind margin of tergite 1 to a variable extent, and greater part of femora are black. The base of second submarginal cell in the typical form tends to be only subtruncate whereas in the colour form it tends to be rectangularly truncate and with a short stump. The third antennal joint (side view) in ♂ at least is more subparallel-sided to beyond the middle in the typical form and less conical. In the case of the ♀♀ the colour and other differences are less evident : all the femora in the typical form tending to be mainly yellowish whereas in the colour form the front ones are broadly darkened across middle to a variable extent and hind ones often darkened medially above, and hind margins of tergites tend to be more broadly yellowish in the typical form. The base of the second submarginal cell in ♀♀ however does not appear to differ so consistently in the two forms as in ♂♂.

Crocidium lactipenne n. sp.

Also belonging to the *poecilopterum* and *chrysonotum*-section is a species from the southern coastal region which very closely resembles *microstictum*, especially the colour form of the latter, and from which it may however be distinguished as follows :

Body with even less yellowish ; antennae dark in both sexes ; scutellum entirely black in both sexes ; hind margin of tergite 1 entirely dark or only very narrowly and obscurely pallid in some ♀♀, and pallid hind margins of the other tergites very much narrower, and only about half the hind margins of last tergite and sternite in ♀ yellowish ; entire femora, excepting only extreme yellowish apices, dark or black in ♂ and to a large extent also mainly dark in ♀, though the bases and even under surfaces to a variable extent are yellowish in some ♀♀ ; tibiae in ♀ mainly yellowish as in *microstictum*, but apical parts more darkened, in some ♀♀ they are also darkened basally to a variable extent ; tibiae in ♂ dark but characteristically broadly yellowish across middle. *Head* with the eyes in ♂ in contact for a distance about $1\frac{1}{3}$ – $1\frac{2}{3}$ times length of ocellar tubercle ; interocular space on vertex in ♀ about $2\frac{1}{2}$ – $2\frac{3}{4}$ times width of ocellar

tubercle ; proboscis about 0.68–1 mm. long. *Vestiture* with the hairs distinctly less dense and both hairs and scaling, even on disc of thorax above in both sexes, entirely sericeous whitish, not distinctly yellowish. *Wings* distinctly more conspicuously and intensely subopaquely milky whitish ; spots on the whole darker, the one at base of common base of veins 2 and 3 distinctly larger, more conspicuous, and infusion across middle of first posterior cell, especially in ♀, more consistent and relatively broader ; veins on the whole darker, even in unspotted parts ; base of second submarginal cell more consistently rectangularly truncate and provided with a short stump, knobs of halteres also entirely whitish.

From 3 ♂♂ and 7 ♀♀ in the South African Museum.

Length of body : about 2.6–3.88 mm.

Length of wing : about 2.56–3.64 mm.

Locality.—Southern Coastal Region : On flowers on dunes at Pearly Beach in the Bredasdorp Division (S. Afr. Mus., Dec. 1959).

From the ♂ of *poecilopterum* Lw., which has similarly spotted wings, these ♂♂ may at once be distinguished by the relatively smaller and less rounded spots, very much smaller spot at apex of anal cell, broader yellowish hind margins of tergites and relatively shorter proboscis. From *chrysonotum* Hesse, especially the ♀, it differs in having the third antennal joints more conical, less humped, the hairs and scaling above distinctly less dense and slightly less deeply yellowish, the spots in wings smaller, more defined, less confluent and without a conspicuous cloudy infusion across middle of wings, and the much darker veins.

Crocidium costilabre n. sp.

A characteristic species, with feebly spotted and slightly tinted wings, which is characterized as follows :

Body mainly black and dull, with greyish bloom ; buccal rim obscurely pallid ; anterior spiracular area, to a certain extent notopleural fold, sclerites surrounding wing-base, postalar ridge on side, ligamentous connection between squama and scutellum, extremely narrow and obscure hind margins of tergites and sternites (more discernible in denuded specimens and in ♀), junction between tergites and sternites in ♀, small area below base of halteres, articulation between hypopleuron and posterior coxae, very narrow hind margin of metapleural part, apices of femora, greater part of tibiae, excepting darkened apices, and greater part of basal joint of tarsi yellowish. *Vestiture* with the hairs and scaling fairly dense, but shortish, sparse on facial region, the hairs whitish on body below, more yellowish to golden on thorax anteriorly and on scutellum ; hairs on ocellar tubercle, occiput, thorax discally above and on abdomen above, especially posteriorly, dark or black ; scaling golden yellowish on thorax, scutellum and abdomen above and in ♀ on frons, whitish on abdomen

below and on femora but more yellowish on tibiae. *Head* with the eyes in ♂ in contact above for a distance about $1\frac{1}{2}$ – $1\frac{3}{4}$ times length of ocellar tubercle; interocular space on vertex in ♀ about $2\frac{1}{2}$ times width of ocellar tubercle; frons in ♀ medially depressed towards antennae; face subequal in length to antennal joints 1 and 2 combined, medially longitudinally raised or convex; antennal joint 1 shortish, only about $2\frac{2}{3}$ –3 times length of joint 2; joint 3 elongate, distinctly curved or humped in appearance and, excluding terminal element, nearly twice length of joints 1 and 2 combined; terminal element rather conspicuous, quite or nearly as long as antennal joint 2; proboscis short, stoutish, about 1–1.2 mm. long; palps relatively long, quite as long as antennal joint 3 plus terminal element. *Wings* relatively long, narrowish, faintly tinted yellowish brownish, with faint, but distinct, brownish spots on cross veins and at base of first submarginal cell; those on apical cross veins of discoidal cell tending to be confluent; apical part of costal cell comparatively long and yellowish; veins brownish, becoming more yellowish basally and in coastal part; second vein rather long and straight; middle cross vein much beyond middle of discoidal cell, at about between its apical fourth and fifth; knobs of halteres entirely pale, pallid or yellowish in both sexes.

From 3 ♂♂ and 1 ♀ (types in the South African Museum).

Length of body: about 4.16–4.8 mm.

Length of wing: about 3.68–4.64 mm.

Locality.—Knersvlakte in Southern Namaqualand (Mus. Staff, Sept. 1941). From *chrysonotum* Hesse, which it very superficially resembles, it may however at once be distinguished by its relatively smaller size, the distinctly less spotted and maculated and narrower wings, the much straighter second vein, the dark hairs on head and disc of thorax, and the medially convex face.

Crocidium pachycerum n. sp.

A species with shortish, unspotted wings, characterized as follows:

Body in ♂ mainly black, dull, covered with greyish whitish bloom which on thorax anteriorly above is replaced by more pale greyish brownish bloom, continued posteriorly as two submedial streaks and separated by the black of rest of thorax above; some of the sclerites around base of wings, hind margins of tergites broadly, broad hind margins of sternites, hind margin of metapleural part, entire femora, tibiae and basal parts of tarsi yellowish or luteous, the extreme hind margins of tergites and sternites however ivory whitish and greater part of venter tending to be yellowish. *Vestiture* with the hairs on body and legs fairly dense, relatively shortish, mainly whitish, but hairs and scaling on disc of thorax, the scaling on abdomen above and scaling on tibiae in certain lights gleaming more sericeous yellowish. *Head* with the eyes in ♂ in contact above for a distance quite $2\frac{1}{2}$ times length of ocellar tubercle; coarser facets in upper half of eyes well marked off or linearly demarcated

from finer ones in lower half ; antennal joint 1 markedly stoutish or thickened and densely haired, quite or nearly 4 times as long as joint 2 ; joint 3 (plus terminal element) about as long as joints 1 and 2 combined, gradually narrowed apically, more rapidly so above, the joint slightly curved, not distinctly humped, its terminal element relatively small, shorter than antennal joint 2 ; face markedly short, very much shorter than antennal joint 1 ; genae relatively narrow ; proboscis short, only about 1.2 mm. long ; palps subequal in length to antennal joint 3. *Wings* relatively short, unspotted, with a slight milky whitish subopacity, more evident basally and in costal cell ; costal vein, first vein, apex of costal cell and veins at base of wing yellowish ; rest of veins brownish ; discoidal cell more subspindle-shaped ; middle cross vein only a little beyond middle of discoidal cell ; second vein substraight ; second submarginal cell subacute basally ; vein between first and second posterior cells almost straight, not bent forwards ; squamae whitish ; knobs of halteres entirely pale yellowish white. *Legs* with rather dense hair on front and middle femora ; spicules on tibiae comparatively feebly developed. From a single ♂ in the South African Museum.

Length of body : about 6 mm.

Length of wing : about 4.56 mm.

Locality.—Western Cape : Bulhoek between Clanwilliam and Klawer in the Olifants River Valley (Mus. Exp., Oct. 1950).

The slightly thickened first antennal joints, very short face, position of middle cross vein and entirely luteous legs distinguish this species from other known forms with unspotted wings.

Crocidium tinctipenne n. sp.

A form with unspotted, but faintly dusky, wings which is characterized as follows :

Body and legs in ♂, and also in a somewhat denuded and slightly damaged ♀-specimen (which I take to be the ♀ of this species) mainly black and dull, covered with greyish bloom which on thorax above leaves uncovered two sub-medial black discal streaks and a broad lateral streak on each side ; abdomen in both sexes entirely black or only with scarcely discernible and very obscure and inconspicuous, narrow greyish whitish hind margins ; anterior spiracular area, sclerites around base of wings (especially below) and basal parts of tarsi yellowish brownish or reddish brown ; tibiae also slightly less dark than femora, more piceous brownish. *Vestiture* with the hairs even in ♂ not very dense ; those on first antennal joints, ocellar tubercle, upper part of occiput, on thorax and scutellum above, on abdomen above discally, but especially posteriorly, on hypopygium of ♂ and also on venter posteriorly in ♀ black ; those on rest of body below and on legs whitish ; scaling on body above gleaming more pale brassy yellowish. *Head* with the eyes in ♂ in actual contact above

for a relatively short distance, only a little longer than ocellar tubercle ; upper coarser facets of eyes not markedly delimited, only imperceptibly grading into finer lower ones ; interocular space on vertex in ♀ about $2\frac{2}{3}$ times width of ocellar tubercle ; frons in ♀ transversely depressed ; face quite as long as or subequal in length to antennal joints 1 and 2 combined ; antennal joint 1 about $3\frac{1}{2}$ to $3\frac{3}{4}$ times length of joint 2 ; joint 3 curved, appearing humped at middle, distinctly longer than joints 1 and 2 combined, its terminal element subequal in length to joint 2 ; proboscis short, about 0.6–1.2 mm. long ; palps longish, at least as long as antennal joint 3. *Wings* faintly, but distinctly, dusky or tinted yellowish brownish, without any spots ; veins yellowish brownish, becoming yellowish in costal and basal parts ; apex of costal cell yellowish ; second vein straight ; discoidal cell subspindle-shaped ; middle cross vein a little beyond middle of discoidal cell, at between a little less or a little more than apical third ; knobs of halteres entirely pallid in both sexes. *Legs* with the spicules on tibiae well developed.

From 2 ♂♂ and 1 ♀ (types in the South African Museum).

Length of body : about 3.12–4.12 mm.

Length of wing : about 3.24–4.68 mm.

Localities.—Namaqualand : Bowesdorp (Mus. Staff, Sept. 1941) (♂-holotype). Southern Namaqualand : Knersvlakte (Mus. Staff, Oct. 1939) (♀-allotype).

Easily recognized and distinguished from other known species with unspotted wings and short proboscis, by the faintly tinted wings, the black hair on body above and the black abdomen.

Crocidium namaquense n. sp.

A smallish species, frequenting flowering Mesembryanthemums in the driest parts of Namaqualand and the Karoo, and characterized as follows :

Body mainly black, dull, covered to a large extent in the undenuded state with greyish white bloom and leaving the usual pattern of a broadish central streak and lateral discal parts black on thorax above ; lateral parts of buccal rim, small anterior spiracular spot (or anterior spiracle), sclerites just below wing-base, to a certain extent ligamentous connection between squama and scutellum, very narrow hind margins of tergites and sternites in ♂, much broader and more conspicuous hind margins of tergites and sternites (or even greater part of venter) in ♀, to a certain extent area just below base of halteres, obscure hind margin of metapleural part, extreme apices and knees of femora in ♂, more extensive apical parts of femora in ♀ and greater part or even almost entire tibiae and bases of tarsi in ♀ (and occasionally also in ♂) pallid or pale yellowish ; humeral angles and postalar calli usually more dark reddish brownish or piceous brownish ; tibiae in ♂, if not obscurely yellowish in part, usually paler piceous or reddish brownish than femora, and in ♀ and to a certain extent

in some ♂♂ (with yellowish tibiae) usually darkened apically and basally to a variable extent, usually with the spicules pale or yellowish even in ♂. *Vestiture* with the hairs on body and legs, even in ♂, not very dense, rather sparse, almost entirely whitish, those on thorax above with a slightly more sericeous yellowish tint in ♂, more distinctly yellowish in ♀; scaling on body rather sparse in ♀ and distinctly more brassy to golden yellowish above. *Head* with the eyes in ♂ in actual contact above for a slightly variable distance, from about $1\frac{3}{4}$ – $2\frac{1}{3}$ times length of ocellar tubercle; upper coarser facets in eyes gradually grading into finer lower ones; frons in ♀ comparatively narrowish, depressed centrally and also transversely so anteriorly, at base only about a little more than twice width of ocellar tubercle; antennal joint 1 relatively shorter in ♂ than in ♀, about 3 or a little less or a little more times length of joint 2 in ♂ and in ♀ about 4 times or a little less; joint 3 conical, gradually narrowed apically, not curved or humped in appearance, usually a little longer than joints 1 and 2 combined; face shortish, much shorter than antennal joints 1 and 2 combined; genae comparatively narrow; proboscis shortish, about 0.52–1.2 mm.; palps long, very much longer than antennal joint 3, the apical joint slender, not or scarcely thickened or dilated. *Wings* greyish hyaline, subopaquely more yellowish or yellowish white to whitish at base or in costal cell, iridescent, without any spots; veins yellowish brownish to brown, becoming more yellowish basally and in costal part; second vein more or less straight; discoidal cell relatively long and narrowish, subspindle-shaped, markedly narrowed apically, its apical cross vein short to very short; middle cross vein characteristically only a little beyond middle or even at about or around middle of discoidal cell; basal part of third vein between base of first submarginal cell and cross vein distinctly shorter and very much shorter than rest of third vein to base of second submarginal cell; knobs of halteres usually entirely pallid or yellowish white in both sexes, but in some ♂♂ sometimes slightly darkened on outer apical part. *Legs* with the spicules on tibiae feebly developed. From 33 ♂♂ and 62 ♀♀ (types in the South African Museum).

Length of body : about 2–3.44 mm.

Length of wing : about 2–3.08 mm.

Localities.—Southern Namaqualand : Knersvlakte (Mus. Staff, Oct. 1939) (types). North Western Cape (South Eastern Namaqualand) : Brandkop near Nieuwoudtville (Mus. Staff, Sept. 1941). Koup Karoo : Klaarstroom in Prince Albert Dist. (Mus. Exp., Oct. 1952).

Crocidium dichopticum n. sp.

This species, represented by only a single dichoptic ♂, is remarkable in that it is the first recorded species of this genus in which the eyes of the ♂ are not in contact above. It is characterized as follows :

Body in ♂ mainly black, dull, covered with greyish white bloom; buccal

rim, anterior spiracular area, sclerites below base of wing, ligamentous connection between squama and scutellum, very narrow hind margins of tergites and sternites and to an obscure extent area around base of halteres pallid or yellowish; tibiae slightly more reddish brownish than dark femora, and basal parts of tarsi more reddish brown or yellowish brownish. *Vestiture* with the hairs on body and legs fairly dense, mainly whitish; those on head below longer and denser; those on disc of thorax gleaming more sericeous yellowish; scaling on body above and to a certain extent on tibiae also more yellowish. *Head* with the eyes in ♂ broadly separated above by a space nearly twice as broad as ocellar tubercle at level of latter; frons slightly depressed medially and centrally; face quite as long as antennal joints 1 and 2 combined, slightly convex medially; genae relatively narrow; antennal joint 1 slender, about four times length of joint 2; joint 3 conical, gradually narrowed apically, not curved or humped, longer than joints 1 and 2 combined, its terminal element shorter than joint 2; proboscis about 0.88 long; palps relatively long, nearly or about as long as antennae. *Wings* subopaquely whitish, with very faint suggestions of slight spot-like darkenings on apical cross veins of basal cells and base of second submarginal cell; veins yellowish, becoming slightly more yellowish brownish in hinder half; second vein straight; discoidal cell normally subtriangular; middle cross vein much beyond middle of discoidal cell, at between its apical fifth and fourth; basal part of third vein between base of first submarginal cell and middle cross vein only a little longer than rest of vein between cross vein and base of second submarginal cell; knobs of halteres entirely pallid. *Legs* with the spicules on tibiae very feebly developed.

From a single ♂ specimen in the South African Museum.

Length of body: about 2.88 mm.

Length of wing: about 2.88 mm.

Locality.—North Western Cape: Brandkop near Nieuwoudtville (Mus. Staff, Sept. 1941).

The dichoptic condition of the eyes in the ♂ distinguishes this species from all other known forms.

Crocidium dasypolium n. sp.

A species belonging to the *phaenochilum* and *depressifrons*-section and of which the ♀ is characterized as follows:

Body and legs mainly black, dull, but basal half of frons, especially part surrounding ocellar tubercle, face and upper part of genae brilliantly shining black, smooth as if polished; a broadish band across buccal cavity from eye to eye and not extending much on head below or very high up on genae (below level of apex of buccal cavity) ivory yellowish, only genal groove and a spot at its lower part in this yellowish band black; apex of humeral tubercle, sclerites below base of wings, base of halteres and articulation between hypopleuron and posterior coxae obscurely reddish brownish; knees (or rather articulation)

also reddish brownish ; abdomen entirely black. *Vestiture* with the hairs not very dense, however dense and long on head below ; all the hairs on body and legs whitish ; shining face and frons hairless ; scaling, where not denuded, white ; that on body below and legs lanceolate. *Head* with the frons broad, at base about $2\frac{2}{3}$ times width of ocellar tubercle, narrowly transversely depressed just beyond middle, the depression faint or obscure on sides ; face medially and broadly convexly prominent, subequal in length to or about as long as antennal joints 1 and 2 combined ; genae very broad as in other species in this section ; antennal joint 1 long, slender, about $5\frac{1}{3}$ times length of joint 2 ; joint 3 elongate, rod-like, very much longer than joints 1 and 2 combined, nearly or quite as long as frons across base, its terminal element shorter than joint 2 ; proboscis long, about 2.88 mm. long from extreme base ; palps nearly as long as antennal joints 1 and 2 combined. *Wings* feebly tinted whitish, more so in costal cell and basally, without any spots ; veins dark brownish ; second vein straight up to near its end ; middle cross vein much beyond middle of discoidal cell, at about its apical fourth ; basal part of third vein from base of first submarginal cell to cross vein only a little longer than part beyond cross vein to base of second submarginal cell ; squamae whitish ; knobs of halteres entirely pale or pallid. *Legs* with the spicules on tibiae well developed.

From a single ♀ in the South African Museum.

Length of body : about 5.44 mm.

Length of wing : about 4.8 mm.

Locality.—Tankwa Karoo : Renoster River (Mus. Exp., Nov. 1952).

From the ♀ of *depressifrons* Hesse, which it more closely resembles, it differs in having the abdomen entirely black, the entire scutellum black, broader and more broadly convex medial part of face, less deeply distinct transverse depression on frons, and much longer and denser hairs on head below.

Crocidium leucostomum n. sp.

A species with spotted wings, of which the ♀ is characterized as follows :

Body mainly black, the integument of medial part of face, greater middle part of frons and extending angularly half-way down occiput, and to a certain extent abdomen smooth, black and brilliantly shining as if polished ; rest of integument of body, including narrow sides of frons, rest of occiput, head below, thorax, scutellum and pleural parts dull, covered with whitish bloom ; sides of face, entire genae and buccal rim conspicuously and broadly ivory whitish or yellowish ; also yellowish are first antennal joints, triangular frontal depression just behind antennae, medial apical part of scutellum, to a certain extent also sclerites just below base of wings, articulation between hypopleuron and posterior coxae, narrowish hind margin of metapleural part, fairly broadish hind margins of tergites and sternites, extreme apices of femora, especially of middle ones, and lower apical parts of the others, the tibiae (excepting only

the dark apical parts), and basal parts of tarsi. *Vestiture* with the hairs, though comparatively dense for a ♀, not markedly dense, not very dense on genae, mainly whitish, but with a slightly more sericeous yellowish tint on body above; hairs and even scaling absent on black shining part of frons and middle part of face; scaling on body above more yellowish, brassy or golden, white on body below and on legs. *Head* with the frons broad, gradually diverging anteriorly, about 3 times width of ocellar tubercle across its base, mainly convex, without any central or transverse depression, only fairly deeply triangularly depressed anteriorly just behind antennae; face quite as long as antennal joints 1 and 2 combined, longitudinally slightly raised or convex along black and shining middle part; antennal joint 1 slender, about $3\frac{2}{3}$ times length of joint 2 (joint 3 missing in specimen); proboscis stoutish, long, about 2 mm. long when almost fully extended; palps shortish, very slender, but quite as long as antennal joints 1 and 2 combined. *Wings* distinctly subopaquely whitish, with distinct and conspicuous, rounded, dark brownish spots on cross veins, at bases of first and second submarginal cells and at apex of anal cell and smaller ones at ends of longitudinal and posterior veins, and even on small cross vein in costal cell and at base of second basal cell; spots on apical cross veins of discoidal cell confluent; veins dark in the spots and more yellowish in unspotted parts and in costal part; base of hind margin of axillary lobe also markedly dark or brownish; discoidal cell subtriangular; middle cross vein much beyond middle of discoidal cell, at nearly apical fourth to a little more than apical fourth of latter cell; vein between first and second posterior cells normally curved forwards; second vein slightly undulating; knobs of halteres entirely very pale yellowish white. *Legs* with the spicules on tibiae well developed.

From a single ♀ in the South African Museum.

Length of body: about 4.4 mm.

Length of wing: about 3.68 mm.

Locality.—Knersvlakte in Southern Namaqualand (Mus. Exp., Oct. 1950).

In its spotted wings it resembles the ♂ of *poecilopterum* Lw., but cannot be mistaken for the as yet undescribed ♀ of the latter species on account of the much longer proboscis, much longer first antennal joints, its brilliantly shining black face and frons, and the markedly darkened apices of the tibiae. The characteristically spotted wings distinguish it from all other known species of which the ♀♀ have a broad yellowish band across the facial part and brilliantly shining black face and frons.

KEY TO THE KNOWN SOUTH AFRICAN SPECIES OF *Crocidium*

- 1 (a) Antennal joint 3 relatively shorter, very much broader (side view), flattened, conical, usually humped in appearance; proboscis very much shorter, stouter, not longer than about 1.5 mm.; face in ♂♂ and frons and face, or frons only, in ♀♀ dull, not brilliantly shining and smooth and, if rarely so, antennal joint 3 is short

- (b) Antennal joint 3 relatively longer, more strap-like, rod-like or cylindrical, not rapidly or markedly broadened at about middle, not humped; proboscis distinctly longer, usually more slender and usually much longer than 1.5 mm.; face in ♂♂ and face and frons in ♀♀ rarely not smooth and polished or brilliantly shining and, if not so, antennal joint 3 at least elongate and not humped 18
- 2 (a) Wings with distinct, relatively large, conspicuous spots or spot-like infuscations on cross veins and other veins or with distinct dark bands or infusions more or less broken up into spots, or wings are dusky and faintly spotted; spicules on tibiae more strongly developed; legs in ♂♂ usually with the tibiae yellowish or with some yellow and in ♀♀ rarely mainly dark, usually with even femora extensively yellowish or with more extensive yellowish apices 3 (♂♂); 9 (♀♀)
- (b) Wings either without any spots or with only very faint and small, inconspicuous, scarcely perceptible infusions on cross veins; spicules on tibiae less strongly developed, feeble or even absent; legs in ♂♂ usually entirely dark, rarely with entirely yellowish tibiae, the femora in known ♀♀ mainly dark or with more extensive dark, rarely entirely yellowish 14 (♂♂); 17 (♀♀)
- 3 (a) Wings distinctly more subopaquely whitish; hairs on body and legs distinctly less dense and shaggy, entirely or mainly whitish or at least much paler yellowish on head and thorax above; spicules on tibiae feebler, distinctly less strongly developed 4
- (b) Wings distinctly more subopaquely greyish yellowish or more yellowish than whitish to even dusky or distinctly infuscated; hairs on body and legs distinctly much or very much denser, more shaggy and much darker on head and thorax above, either deeper yellowish, golden to dark; spicules on tibiae distinctly more conspicuous, more strongly developed 7
- 4 (a) Spot (or spots) across anal and axillary cells large and conspicuous, and the others in wings distinctly much larger, more rounded, comparatively paler, without a spot at base of second and third veins, and with more rounded small spots near ends of posterior veins; veins (except in spots) much paler, more pallid; knobs of halteres darkened above; hairs on body, especially on mesopleuron, abdomen and coxae, distinctly longer, denser; apical joint of claspers of hypopygium long and curved ♂ *poecilopterum* Lw.
- (b) Spot at apex of anal cell distinctly very much smaller, insignificant, and the others more in form of elongate smaller and darker infusions along cross veins, with a distinct, consistent spot or infusion near common base of second and third veins, and with only narrowish infusions or indications of such at apices of posterior veins; veins themselves relatively darker, much more so in spots; knobs of halteres entirely whitish; hairs on body distinctly less dense, relatively shorter; apical joint of claspers very much shorter, more flattened 5
- 5 (a) Body with more yellowish, the first antennal joints, humeral tubercles, prosternal part, at least hinder part of scutellum, broadish hind margins of tergites, apical halves or greater part of or even entire femora yellowish; antennal joint 3 (side view) more or less parallel-sided to beyond middle; base of upper cubital branch usually not straight at right angles to third vein and without a distinct short stump ♂ *microstictum* n. sp. (typical)
- (b) Body with less yellowish, not all these sites yellowish, first antennal joints, humeral tubercles and entire scutellum black, the hind margins of tergites very much narrower yellowish or ivory yellowish, and that of tergite 1 either not yellowish or only narrowly so on sides, and femora mainly or almost entirely dark; antennal joint 3 (side view) appearing broader basally or more rapidly narrowed from there; base of upper cubital branch usually straight at right angles to third vein and with a distinct short stump 6
- 6 (a) Legs with apical parts of femora more extensively yellowish, the tibiae almost entirely yellowish, only apical parts sometimes slightly darkened; hind margin of tergite 1 sometimes slightly or very narrowly pallid, especially on sides; wings, though milky whitish, distinctly less intensely so, the spots less dark and one at base of second and third veins distinctly fainter, smaller, and veins, especially in unspotted parts, paler; hairs on body relatively denser, those as well as scaling on disc of thorax distinctly tinted more pale sericeous yellowish or even yellowish ♂ *microstictum* n. sp. (colour form)
- (b) Only extreme apices of femora yellowish and tibiae only yellowish across middle or even almost entirely dark, being very dark apically; hind margin of tergite 1 entirely black; wings distinctly more intensely and conspicuously subopaquely milky whitish, the spots on the whole darker, the one at base of veins 2 and 3

- distinctly darker, larger, more conspicuous, and veins on the whole darker; hairs on body relatively sparser and those on disc of thorax entirely sericeous whitish like rest of hair ♂ *lactipenne* n. sp.
- 7 (a) Wings comparatively narrower near base across broadest part of axillary lobe, less obviously narrowed apically and apex comparatively more broadly rounded; second vein markedly straight; discoidal cell smaller, narrower, as long as or not much longer than diagonally across third posterior cell; face distinctly more longitudinally convex or ridged in appearance; postalar calli and scutellum entirely black or mainly dark; hind margins of tergites and sternites not, or only very narrowly and obscurely, yellowish if at all ♂ *costilabre* n. sp.
- (b) Wings markedly broad, especially across broadest part of axillary lobe, markedly narrowed apically, the apex more pointed; second vein more undulating; discoidal cell broader, larger, distinctly very much and markedly longer than third posterior cell; face broader, distinctly more convex transversely; postalar calli and especially hinder part or hind border of scutellum yellowish or reddish; hind margins of tergites and sternites either broadly yellowish or yellowish reddish or more distinctly so even if only narrowly 8
- (a) Wings subopaquely yellowish whitish, with distinct and conspicuous brown to dark brownish spots and infuscations on cross veins, infusions across base of discoidal cell to end of false vein in costal cell, across middle of second basal cell to second vein and narrowly along posterior veins; veins more yellowish or yellowish brownish; palps yellowish; hind margins of tergites and sternites more broadly yellowish reddish; femora more extensively yellowish apically; hairs on ocellar tubercle, thorax and scutellum above and on coxae paler, more yellowish or golden; antennal joint 3 distinctly broader from side ♂ *chrysonotum* Hesse
- (b) Wings uniformly subopaquely smoky brownish or dusky, with the base, greater part of costal cell and across middle of first basal cell to apex of second whitish, with only feeble or faint, inconspicuous indications of spot-like infuscations on cross veins; veins much darker, dark brownish to black; palps dark; hind margins of abdominal segments only narrowly yellowish to ivory whitish; femora distinctly less extensively yellowish apically, the yellowish confined to extreme apical part; hairs on ocellar tubercle, thorax and scutellum above and on coxae mainly dark or black; antennal joint 3 distinctly narrower ♂ *phaeopteralis* Hesse
- 9 (a) Hind border or part, or even entire, scutellum reddish or yellowish to a variable extent; femora either entirely or predominantly yellowish, or middle and hind ones extensively or entirely yellowish or at least their apical parts extensively or more broadly yellowish; hind margins of tergites usually more broadly yellowish and, if narrowly so, hind border of scutellum is red 10
- (b) Entire scutellum black; femora more extensively darkened, either with the upper or anterior faces extensively darkened or with only extreme apices yellowish; hind margins of tergites only narrowly yellowish, scarcely pallid or not at all 13
- 10 (a) Wings more subopaquely whitish or greyish yellowish, the transverse subopaquely whitish band in front half across apex of second basal cell less evident; brownish spots and infusions on cross veins and at other sites very conspicuous, the wings more spotted or mottled; veins paler, more yellowish; palps mainly yellowish; hind margins of abdominal segments broadly yellowish or yellowish reddish; femora either entirely or mainly yellowish, or at least with more extensive yellowish; hairs on ocellar tubercle, head below and on coxae whitish, sericeous yellowish or yellowish; scaling on head above and body above whitish, pale yellowish to golden II
- (b) Wings distinctly more subopaquely smoky brownish or dusky, the transverse subopaquely whitish band in anterior half across apex of second basal cell more obvious; spot-like infuscations on cross veins fainter, appearing less conspicuous; veins darker, dark brown to blackish brown; palps dark; hind margins of abdominal segments either not or only very narrowly and obscurely reddish; femora mainly dark, only apical parts yellowish; hairs on ocellar tubercle, head below and on coxae dark or black; scaling on head and body above deeper reddish golden ♀ *phaeopteralis* Hesse
- 11 (a) Antennal joint 3 distinctly broader, more curved or humped above; hairs and scaling on head, body and legs distinctly denser, those above deeper golden yellowish; femora entirely yellowish; wings more subopaquely yellowish whitish or yellowish, the spots and infusions more diffused, more confluent, and with more infuscation along posterior veins and also with more distinct and

darker cloudiness in front half transversely across from base of discoidal cell to costal cell and across base of third vein, the whitish band between them showing up more distinctly; slightly larger form, about 4.5-5.5 mm.

♀ *chrysonotum* Hesse

- (b) Antennal joint 3 narrower, more conical, less curved or humped above; hairs and scaling on body distinctly less dense, more whitish or paler, more sericeous yellowish, less golden above; femora with the front ones sometimes darkened in middle part to a variable extent and hind ones sometimes with a variable dark spot or infusion medially on outer face; wings distinctly more subopaquely milky whitish, the spots and infusions on cross veins and veins more defined, often less confluent, smaller, without or with a scarcely perceptible cloudiness in front half from base of discoidal cell to costal border or across base of third vein; smaller forms, only about 2.68-4.56 mm. 12
- 12 (a) Femora including front ones entirely yellowish; antennal joints 1 and 2 tending to be more yellowish; hind margins of tergites usually broader yellowish; base of upper cubital branch not tending to be straight at right angles to third vein and tending to be without a stump
- (b) Femora with front ones broadly darkened to a variable extent across middle and hind ones often also darkened medially above; antennal joints 1 and 2 more darkened or black; hind margins of tergites usually more narrowly yellowish; base of upper cubital branch tending to be more often straight at right angles to the third vein and with a short stump
- ♀ *microstictum* n. sp. (typical)
- ♀ *microstictum* n. sp. (colour form)
- 13 (a) Wings distinctly and conspicuously subopaquely milky whitish; spots and infusions on cross veins and other sites distinctly darker, larger, more conspicuous, and also present across middle of first posterior cell and base of discoidal cell; discoidal cell relatively broader, very much longer than diagonally across third posterior cell; first posterior cell much narrowed just before middle and markedly broadened apically; hind margins of tergites more broadly and distinctly yellowish; antennal joint 3 less S-curved and less humped, and with a shorter terminal element, face not markedly raised longitudinally; hairs and scaling on thorax above entirely sericeous whitish.
- (b) Wings tinted more yellowish or greyish brownish; spots and infusions on cross veins appearing much fainter, smaller, and absent from middle of first posterior cell and at base of discoidal cell; discoidal cell relatively narrower, smaller, not very much longer than diagonally across third posterior cell; first posterior cell only slightly narrowed before middle, almost subparallel-sided; hind margins of tergites only very obscurely and narrowly pallid or not at all; antennal joint 3 more S-curved, appearing more humped, with a longer terminal element; face rather convexly raised along middle; hairs and scaling on thorax above distinctly more yellowish or more golden.
- ♀ *lactipenne* n. sp.
- 14 (a) Eyes in ♂♂ in actual contact above for some distance between ocellar tubercle and antennae, the frons being represented by a small triangle behind antennae; hairs on body, especially on head below and abdomen, relatively shorter, less dense, not shaggy, and, if dense, eyes are in contact; wings hyaline, greyish hyaline or only tinted greyish or yellowish brownish, not markedly subopaquely whitish; discoidal cell more spindle-shaped, narrowed apically, its apical cross veins meeting at right angles or only a little more; spicules on tibiae stronger, more evident.
- (b) Eyes in ♂ broadly separated above, about twice width of ocellar tubercle on vertex, the frons wide, gradually diverging anteriorly and slightly transversely depressed a little beyond middle; hairs on body, especially on head below and abdomen, longer, markedly dense, shaggy, and entirely silvery whitish; wings markedly subopaquely milky whitish; discoidal cell more subtriangular, subtruncate apically, its apical cross veins meeting at a very obtuse angle in almost a straight line; spicules on tibiae less perceptible, almost wanting.
- ♀ *costilabre* n. sp.
- 15 (a) Smaller forms, usually less or much less than 4 mm.; legs entirely black or dark in ♂♂ or hind tibiae may be obscurely or partly yellowish; hind margins of tergites and sternites usually very narrowly pallid or yellowish, sometimes scarcely perceptibly so, or even entirely black; antennal joint 1 shorter, less than 4 times length of 2, usually more slender or normally thick, not densely hairy; joint 3 much longer than joints 1 and 2 combined; face distinctly longer, at least as long as antennal joint 1 or even longer; hairs on body distinctly less dense.
- ♂ *dichopticum* n. sp.

- (b) Larger species, about 5.96 mm. long, with a wing-length of about 4.6 mm.; entire femora, tibiae and basal halves of tarsi yellowish in ♂; hind margins of tergites (especially sides) more broadly and broad hind margins of sternites or even entire venter yellowish reddish; antennal joint 1 distinctly longer, quite 4 times length of 2, distinctly thickened or incrassate, densely haired; joint 3 relatively shorter, subequal in length to joints 1 and 2 combined; face very short, much shorter than antennal joint 1; hairs on body distinctly much denser, entirely pale sericeous ♂ *pachycerum* n. sp.
- 16 (a) Wings distinctly tinted faintly yellowish brownish; discoidal cell less narrowed apically and middle cross vein much beyond its middle; hairs and scaling on body denser and coarser, the hairs on ocellar tubercle, occiput, thorax and scutellum and abdomen (especially posteriorly) above entirely or mainly black; humeral angle and anterior spiracle piceous; abdomen mainly black, the hind margins of segments scarcely perceptibly very narrowly pallid or pale; face distinctly longer and broader, almost or about as long as antennal joints 1 and 2 combined; antennal joint 3 distinctly more curved or humped above; spicules on tibiae more strongly developed ♂ *tinctipenne* n. sp.
- (b) Wings hyaline or greyish hyaline, not distinctly tinted; discoidal cell narrowish, more narrowed apically, sometimes even subacute and middle cross vein close around middle or even at about middle of latter cell; hairs and scaling on body finer, less dense, entirely pale, whitish below and sericeous yellowish above; humeral angle or at least anterior spiracle pale or yellowish; hind margins of tergites and sternites narrowly, but distinctly and sometimes even conspicuously, pallid or yellowish; face distinctly much shorter, narrower, usually much shorter than antennal joints 1 and 2 combined; joint 3 less curved or humped above; spicules on tibiae only very feebly developed ♂ *namaquense* n. sp.
- 17 (a) Wings distinctly tinted faintly yellowish brownish; discoidal cell less narrowed apically and middle cross vein much beyond its middle; hairs on ocellar tubercle, occiput, thorax and scutellum above and on abdomen, especially posteriorly, mainly or entirely black; hind margins of abdominal segments not yellowish; frons distinctly much broader, more broadly transversely depressed; face distinctly longer and broader, almost or about as long as antennal joints 1 and 2 combined; tibiae mainly dark or piceous and spicules on tibiae more strongly developed ♀ *tinctipenne* n. sp.
- (b) Wings hyaline or greyish hyaline, not distinctly tinted; discoidal cell narrowish, more narrowed apically and middle cross vein close around its middle; hairs on head and body above slightly yellowish to golden, pale or whitish below; hind margins of abdominal segments yellowish; frons much narrower and only narrowly transversely (and also longitudinally) depressed; face distinctly much shorter, narrower, much shorter than antennal joints 1 and 2 combined; apical parts of femora to a variable extent and the entire tibiae yellowish and spicules on latter only very feebly developed ♀ *namaquense* n. sp.
- 18 (a) Face in ♂♂ black, its medial part smooth and brilliantly shining; entire face in ♀♀, including sides or upper parts of genae, smooth, black, brilliantly shining as if polished; front of head across genae and buccal rims in ♀♀ ivory whitish, ivory yellowish or bone yellowish to a variable extent, often polished or shining, the ivory yellowish however never occupying sides of face; wings in both sexes entirely unspotted, without even indications of faint spot-like infusions; legs, excepting the knees, usually entirely dark or black 19 (♂♂); 22 (♀♀)
- (b) Face in ♂♂ black, dull, not brilliantly shining along middle or apically; face in ♀♀ either entirely black or dark and dull or brilliantly shining only along middle part, its sides not black and shining; front part of head in ♀♀ either not ivory yellowish or if so the yellowish is much more extensive, usually dull, occupying entire or greater part of sides of face and upper parts of genae; wings in both sexes either with distinct and conspicuous spots or infusions on cross veins and other veins or with faint spot-like infusions on some of the cross veins; legs either mainly yellowish or partly yellowish or in both sexes usually with the tibiae yellowish to a variable extent 25 (♂♂ and ♀♀)
- 19 (a) Palps much reduced, very short or vestigial, inconspicuous, sometimes scarcely perceptible, confined to base of proboscis; upper coarse facets in eyes distinctly and abruptly demarcated from finer lower ones; hairs on body and legs distinctly less dense, sparser and relatively shorter; spicules on tibiae less strongly developed; basal part of third vein between base of first submarginal cell and and middle cross vein tending to be a little longer than, as long as or subequal to or scarcely shorter than rest of vein to base of second submarginal cell 20

- (b) Palps more developed, longer, more conspicuous, not confined to extreme base of proboscis, but conspicuously visible, as long as or longer than antennal joints 1 and 2 combined; upper coarser facets in eyes less abruptly demarcated from finer lower ones, but more gradually grading into them; hairs on body and legs longer, markedly denser; spicules on tibiae more strongly developed, more conspicuous; this basal part of third vein tending to be distinctly shorter or very much shorter than rest of it to base of second submarginal cell 21
- 20 (a) Head markedly broad, at least twice as broad as long; proboscis markedly long and slender, about 3.6-4.2 mm. long; palps vestigial, scarcely perceptible; face much broader, more transversely convex and apically slightly depressed in middle; middle cross vein in wings much beyond middle and nearer apex of discoidal cell; knobs of halteres darkened above; abdomen entirely black, without any pale or yellowish hind margins ♂ *phaenochilum* Hesse
- (b) Head more normally broad, much less than twice as broad as long; proboscis much shorter than 3 mm.; palps slightly longer, slightly more conspicuous; face distinctly much narrower, convex or raised longitudinally; middle cross vein nearer middle than apex of discoidal cell; knobs of halteres entirely pallid or whitish above; hind margins of abdominal segments narrowly yellowish reddish ♂ *depressifrons* Hesse
- 21 (a) Palps much shorter, a little shorter or subequal in length to antennal joints 1 and 2 combined; face more convex apically, more truncated; wings distinctly more subopaquely whitish, the veins dark brown or blackish even to extreme base, without even faint indications of infusions on apical cross veins of basal cells; knobs of halteres markedly dark or black above; hairs and scaling on body and legs relatively denser, entirely whitish; abdomen entirely black and knees also black ♂ *melanopalis* Hesse
- (b) Palps distinctly longer, more conspicuous, very much longer than antennal joints 1 and 2 combined, only a little shorter than entire antennae; face more tumidly rounded; wings less obviously tinted whitish, the dark veins becoming paler, more yellowish towards base and at base, with faint indications of infusions on apical cross veins of basal cells; knobs of halteres more yellowish brown above; hairs on sides of face, on ocellar tubercle and intermixed ones on thorax above darker or more brownish; hind margins of sternites very narrowly and obscurely pallid and knees slightly reddish brown ♂ *nigrifacies* Bezzi
- 22 (a) Frons distinctly transversely depressed groove-like a little beyond middle (just behind two tufts of white scaling); proboscis relatively longer, at least 2-4 mm.; palps usually much reduced, either almost imperceptible or shorter than antennal joints 1 and 2 combined and if longer other characters do not differ; scaling on body (especially below) and on legs usually with broader more lanceolate ones; hind margins of abdominal segments sometimes more conspicuously yellowish or pallid and if entirely black frons with a transverse depression 23
- (b) Frons not distinctly depressed groove-like transversely across middle, only longitudinally depressed or if slightly transversely depressed it is so immediately behind antennal bases and in front of the two tufts of white scales; proboscis relatively shorter, not much more than 2 mm.; palps on the whole longer, conspicuous, usually as long as or even slightly longer than antennal joints 1 and 2 combined; scaling on body below and on legs finer; hind margins of abdominal segments not pallid or yellowish ♀ *nitidilabris* Hesse
- 23 (a) Proboscis markedly long and slender, about 3.6-4.2 mm.; palps much reduced, very short and vestigial, inconspicuous, very much shorter than antennal joints 1 and 2 combined; ivory yellowish or yellowish transverse band across buccal part distinctly broader, even extending to part of head below; second vein in wings slightly undulating; hairs on ocellar tubercle and vertex mainly dark and those on genae and abdomen on the whole denser and longer ♀ *phaenochilum* Hesse
- (b) Proboscis distinctly much shorter, not longer than about 2.8 mm.; palps longer, more conspicuously visible, sometimes quite as long as antennal joints 1 and 2 combined; ivory yellowish or yellowish transverse band across buccal part narrower, occupying less of upper part of genae and head below; second vein straight; hairs on ocellar tubercle and vertex mainly pale or at least with fewer dark ones and those on genae sparser or much shorter and those on abdomen less dense and shorter 24
- 24 (a) Narrow hind margins of abdominal segments, hind border of scutellum, anterior spiracular area, metapleural part around base of halteres and knees yellowish;

- medial raised part of face much narrower; transverse depression on frons deeper, more distinctly groove-like; genal grooves paler; hairs on genae, head below, abdomen and coxae very much shorter and sparser; veins in wings slightly paler, more yellowish brownish . . . ♀ *depressifrons* Hesse
- (b) Hind margins of abdomen, entire scutellum and pleural parts entirely dark or black and apices of femora also black, only articulations dark reddish brown; medial raised part of face broader, more broadly convex; transverse depression on frons relatively shallower, less evident, not straight and groove-like; genal grooves darker or with more black in them; hairs on genae, though sparse, very much longer, those on head below very dense and long and those on coxae and abdomen longer and denser; veins darker, more dark brownish . . . ♀ *dasypodium* n. sp.
- 25 (a) Wings greyish hyaline, with a very slight whitish tint or subopacity in certain lights, unspotted except for spot-like infuscations of variable intensity on apical cross veins of basal cells; upper branch of cubital fork and vein between first and second posterior cells, though curved forwards, not markedly bent or S-curved; longitudinal depression on frons in ♀ longer, extending farther backwards to immediately or almost in front of front ocellus . . . ♂ ♀ *karooanum* Hesse
- (b) Wings distinctly more subopaquely whitish, with large conspicuous spots and infuscations on cross veins and at ends of posterior veins and sometimes even infusions in the posterior cells and other cells, the wings mottled or even banded in appearance; upper branch of cubital fork and vein between first and second posterior cells distinctly more markedly curved or bent forwards, sometimes even more S-curved; central longitudinal or transverse depression on frons in ♀♀ much shorter, not extending backwards to front ocellus, being separated from it by a raised or convex part . . . 26
- 26 (a) Head in ♀ with the frons and medial part of face brilliantly shining black, the entire head in front and sides of face ivory whitish or yellowish; frons anteriorly triangularly impressed; palps much shorter, more slender, only a little longer or scarcely longer than antennal joints 1 and 2 combined; hind margins of abdominal segments relatively more narrowly yellowish; greater part of femora black, only extreme apices or knees yellowish; infuscations in wings only in form of large spots on cross veins and at apex of anal cell and smaller ones at ends of posterior veins, there being no cross bands; hairs and scaling on body shorter, less dense, the frons and face being almost bare and that on thorax above and on abdomen much paler yellowish; smaller form about 4.4 mm. long . . . ♀ *leucostomum* n. sp.
- (b) Head in ♀ entirely dull black, not shining, only lateral part of buccal rim pallid; frons transversely depressed; palps markedly long, stouter, very much longer than antennal joints 1 and 2 combined; hind margins of abdominal segments (entire tergites 2-4) more broadly yellowish; entire femora (excepting only extreme dark bases of front and hind ones) and tibiae yellowish; wings in addition to spots on cross veins and at ends of veins also with infusions in the cells, more or less in two cross bands (across at level of apex of second basal cell and arcuately across from end of costal cell to third posterior cell); hairs and scaling very dense and long, woolly, the entire head (excepting eyes) very densely hairy and white-haired below, and that on thorax and abdomen above very deep brownish or reddish golden; larger form, about 6.16 mm. long . . . ♀ *pterostictum* Hesse

Subfam. TOXOPHORINAE

Gen. *Toxophora* Meigen

Meigen, 1803, p. 270; Bezzi, 1924, p. 128; Hesse, 1938, p. 1029.

Very little is to be added to my long and fairly comprehensive description of this genus in 1938. The discovery of another new species with four posterior cells in the wings instead of the three which up to now have characterized the wings of *Toxophora* s. str., however necessitates the recording of this fact. Apparently this additional posterior cell has been brought about by the complete division of the normal single combined second and third posterior cells of this

genus into two by the extension of the stump or appendix which projects from the discoidal cell into the large second posterior cell in some species such as the Palearctic *epargyra* Herm. and the South African *epargyroides* Hesse (1938, p. 1038), thus completing the total number of posterior cells which is the normal condition for most Bombyliidae.

Toxophora epargyroides Hesse

Hesse, 1938, p. 1038.

Since the description of the ♂ of this species which Bezzi originally identified as *epargyra* Herm., the South African Museum has acquired an as yet undescribed ♀ specimen from Rhodesia.

This ♀ agrees with the ♂ in most respects, but differs in having the second and third antennal joints relatively shorter, though as in the case of some other species, the proportions remain the same as in ♂; joint 3 less attenuated, its terminal style being shorter and less spine-like; interocular space on vertex relatively narrow, only about $1\frac{3}{4}$ times distance between outer margins of posterior ocelli; hind femora as in ♀♀ of other species, without the usual 2 spines below in basal half which are present in ♂♂.

This ♀-type of the species was collected by Capt. R. Stevenson at Bulawayo (3.I.24) in Southern Rhodesia.

The original ♂-type comes from Otjituo in Damaraland and the new locality therefore extends the distribution of this species.

Toxophora quadricellulata n. sp.

This interesting aberrant form with four posterior cells in its wings, instead of the normal three usually present in *Toxophora*, is characterized as follows:

Body black. *Vestiture* with the scaling on antennae black, gleaming greyish; patch on each side of frons white; scaling on upper part of occiput, excepting only a white postocellar patch, black; bristly hairs on occiput white; scaling on sides and front part of thorax white, the denser and larger ones grouped in rosettes on notopleural part broadish, lanceolate; scaling on abdomen above and below dense and composed of snow-white ones and black graphite- or greyish-gleaming ones, the latter arranged as a large, submedial, basal patch on each side of tergite 1, confluent with a large transverse patch on each side in more than basal half of tergite 2 and extending round to near extreme sides, with a similar patch on each side of tergite 3 and a row of large, submedial basal spots, one on each side of tergites 4-7 respectively, decreasing in size posteriorly and fairly broadly separated discally by the broadish central streak of white ones; all the black patches separated by the broadish bands of white ones across hind margins of tergites; scaling on venter entirely white; scaling on legs white on coxae, on hinder and lower parts of femora and on hinder parts of front and middle tibiae; those on rest of surfaces and also apically on

front and middle tibiae, apices of hind femora and on entire hind tibiae black and gleaming greyish. *Head* with the eyes in ♂ in contact for a distance about $2\frac{1}{3}$ – $2\frac{1}{2}$ times length of ocellar tubercle; interocular space on vertex in ♀ nearly or about 3 times width of tubercle; frons in ♀ shining, slightly transversely depressed anteriorly beyond middle and also centrally for a short distance from this depression to half-way between it and front ocellus; antennal joint 1 about $2\frac{1}{2}$ to nearly 3 times length of 2; joint 3 relatively longer in ♂ and more attenuated apically, nearly or about twice length of 2 in ♂ and about $1\frac{2}{3}$ in ♀; proboscis short, stoutish, about 1.5–2 mm. long; palps nearly or quite half as long as proboscis. *Wings* consistently with four posterior cells, tinted greyish, the costal and first basal cells and to a certain extent base of marginal cell slightly more subopaquely whitish or yellowish white; cross veins not distinctly spotted; cut off first apical (or third submarginal) cell smallish, only a little longer than second submarginal (second apical) cell, its bounding veins not or scarcely curved up much apically; discoidal cell abruptly truncate apically; middle cross vein only a little beyond middle of discoidal cell; veins dark or blackish brown. *Legs* with 4 or 5 spines below in basal half of hind femora in ♂, of which the basal ones usually form a pair; front femora without any longish hairs basally below in ♂, but sometimes with a bristle-like spine.

From 6 ♂♂ and 1 ♀ (types in the South African Museum).

Length of body: about 4.5–6 mm.

Length of wing: about 3.5–5 mm.

Localities.—Namaqualand: Knersvlakte (Mus. Exp., Oct. 1950) (types).

Little Karoo: Oudtshoorn-Zebra (Mus. Exp., Oct. 1951).

Easily distinguished from all the known South African species of *Toxophora* by its four posterior cells. It is however related to *epargyroides* Hesse (1938, p. 1038) from which it differs, apart from the four posterior cells, in having a much shorter first apical cell in the wings, entirely dark-scaled first antennal joints and hind tibiae, and the longer palps.

Toxophora cyanolepida Hesse

Hesse, 1938, p. 1040.

Of this species a ♀ specimen, belonging to the Karoo variety with predominantly chrome yellowish scaling on the abdomen above, was hatched in the South African Museum from the subglobular mud nest of some Eumenid wasp which was collected near Laingsburg in February 1938. It was found that the pupal stage of this specimen had drilled a circular hole through the wall of the mud nest, and that the fully developed ♀ had emerged from its pupal case after slightly less than half of the latter protruded through the exit hole. The pupal skin of this species is characterized as follows:

Head or cephalic part with a prominent cephalic armature in the form of an apically directed chisel-like process, the apical part of which is black, very much

chitinized and its apical margin emarginate, and with both its dorsal and ventral parts longitudinally and centrally deeply grooved, suggesting the fusion of two processes as the origin of this structure ; with a long bristle on each side basally and another laterally on each side just before middle ; basal part of the apical process continued ridge-like on each side below head, ending in a prominent downwardly directed spine and behind the latter in a backwardly and slightly outwardly directed prong or spine, and also with another stiff bristle on each side at inner side of base of the downwardly directed spine. *Abdomen* composed of 8 distinct segments ; tergite 1 with 8-10 slender reddish brown bristles in a row on each side basally ; tergites 2-8 each with a transverse row of longitudinally embedded, elongated spines, arranged comb-like across the middle and having their apical parts free, with also a transverse row of slender bristles situated in the comb, of which those on sides alternate with the spines and thus more closely arranged, and those towards dorsum more widely separated by from 2-4 spines ; lateral fold between tergites and sternites on each side also segmented, somewhat inflated opposite the tergites, each with 3 remarkably long and stout reddish bristles, of which those on sides of tergites 2-6 are the longest and those on sides of last segment the shortest ; sternites 2-7 with 3 slender and longish bristles in a row on each side slightly beyond middle ; last segment narrowed apically, ending in a backwardly directed spine on each side, at the base of each of which there is below a slight hook-like spine.

Length of pupal skin : about 14.5 mm.

Greatest breadth : about 4 mm.

Greatest depth : about 4.5 mm.

From the remains of the Hymenopterous grub inside the mud nests it is impossible to determine even the genus on which this species of *Toxophora* is parasitic. The mud nest, however, is without any doubt that of a Eumenid. That species of *Toxophora* develop in the nests of Eumenid wasps is known in other parts of the world. According to Bezzi (1924, pp. 11 and 129) species of this genus parasitize wasps, such as *Eumenes* and *Odynerus*. As long ago as 1862 Osten-Sacken stated that according to a certain Mr. Glover a species of *Toxophora* in America was obtained from the nest of *Eumenes* ? *fraterna* Say. In a more recent paper Austen (1937, p. 76) refers to a paper published by Auguste Cros (1932, p. 67) in which the latter described the parasitism of *Eumenes pomiformis* F. by the Palaeartic *Toxophora maculata* Rossi.

Toxophora crocisops Hesse

Hesse, 1938, p. 1051.

This species, which was originally described from two ♀ specimens, is now represented in the South African Museum by a ♂ specimen as well. The latter agrees with the ♀ in most of its specific characters, but additional characters both sexual and specific are :

Vestiture with the pattern of snow-white and dark scaling on abdomen similar, but the broad white hind margins of tergites slightly narrower; all the bristles on hind coxae in this ♂ specimen black. *Head* with the antennae as in ♀ and in contrast with ♂♂ of some other species the length of joints 2 and 3 and the fine stylar part of latter joint are also the same as in ♀, but silvery pruinulent streak above joint 2 broader; eyes in contact above for a distance about 3 times length of ocellar tubercle. *Wings* similar, but the slightly darker, more subopaquely yellowish white costal cell and anterior part not so evident in first basal cell as in that of ♀. *Legs* with pale bristly hairs basally below on front femora as in the case of ♂♂ of some other species; hind femora with 3 bristly spines below in basal half of which two at the base form a pair.

Locality.—Little Karoo: oudtshoorn-Zebra (Mus. Exp., Oct. 1951).

ALL THE KNOWN SOUTH AFRICAN SPECIES OF *Toxophora* MAY BE
SEPARATED BY THE FOLLOWING REVISED KEY.

- 1 (a) Wings with 4 posterior cells or with a distinct stump or appendix on apical cross vein of discoidal cell projecting into second posterior cell, tending to divide it; middle cross vein at about or only a little beyond middle of discoidal cell; spot-like infuscations on middle cross vein and basal cross vein of enclosed first submarginal cell absent or scarcely indicated 2
- (b) Wings with only 3 posterior cells, without any stump or appendix on apical cross vein of discoidal cell; middle cross vein distinctly much or very much beyond middle of discoidal cell; spots or spot-like infuscations on middle cross vein and basal cross vein of enclosed first submarginal cell either evident or more conspicuously indicated 3
- 2 (a) Wings with only 3 posterior cells, but second posterior cell tending to be divided by a distinct stump projecting into it from angular part of apical cross vein of discoidal cell; small cut off third submarginal (first apical) cell distinctly longer, much longer than second submarginal (second apical) cell, and its bounding veins more curved up apically; veins paler, more brownish; antennal joint 1 and hind tibiae distinctly and densely white-scaled on outer sides; palps shorter, much less than half length of proboscis, falling far short of base of labella; hind femora in ♂ with only 2 longish spines below ♂ ♀ *epargyroides* Hesse
- (b) Wings consistently with 4 posterior cells, the stump from angular part of apical cross vein of discoidal cell reaching hind margin, entirely dividing second posterior cell into two; small cut off third submarginal cell much shorter, scarcely or only a little longer than second submarginal cell, its bounding veins distinctly less curved up apically; veins much darker, dark blackish brown; antennal joint 1 and hind tibiae entirely or predominantly dark or black-scaled; palps distinctly longer, nearly, quite, or even slightly more than half length of proboscis, about reaching or not falling far short of base of labella; hind femora in ♂ with at least 2 basal spines close together and 2 or 3 shorter ones in a row beyond them ♂ ♀ *quadriceulata* n. sp.
- 3 (a) Wings with the front half or part usually distinctly much darker, darker than hinder less tinted or clearer part, the darker part either dark smoky brownish or with much yellowish or yellowish brown, and wings without or with only a very indistinct milky whitish tint; pale scaling on body, especially on abdomen, usually with much or with some yellowish or ochreous yellowish ones, even if only on sides apically and, if entirely white-scaled, front half of wings at least darker or very dark 4
- (b) Wings more uniformly cinereous or tinted greyish cinereous, the front part or half scarcely perceptibly or only faintly tinged darker or more yellowish than hinder part, but wings rather with a more distinct milky whitish tint in certain lights; pale scaling on body and abdomen entirely or predominantly cretaceous or pearly whitish and, if yellowish scales are present, they occur only along middle of abdomen above in some ♂♂ and not on sides apically, and wings are not distinctly dark or deep yellowish anteriorly 7

- 4 (a) More than front half of wings very dark smoky brown, the infuscation extending in apical half almost to hind border or apices of all the cells beyond third posterior cell; longish scales on outer sides or at least on more than outer basal halves of first antennal joints white; pale scaling on abdomen entirely white, that along middle above in form of a narrow white line; dark scaling on thorax posteriorly, on scutellum and on abdomen above very characteristically deep purplish or ultramarine blue, with a submetallic sheen; venter dark-scaled or with a broad central stripe of dark scales; hind tibiae entirely dark-scaled, only a patch at base above shining silvery. ♂ ♀ *coeruleiventris* Karsch
- (b) Wings usually less darkly tinged, with more yellowish or yellowish brown in anterior costal half, this infuscation less extensive, not extending into discoidal or second posterior cells or into cells in hinder apical half and not so clearly demarcated from clearer parts: scaling on outer surfaces of first antennal joints dark or predominantly dark; pale scaling on abdomen not always entirely white, that along middle above usually in much broader patches or broken up into spots; dark scaling on thorax, scutellum and abdomen above darker, duller even if bluish; venter mainly pale- or white-scaled; hind tibiae with much or more white scaling on at least basal halves of outer or outer upper surfaces. 5
- 5 (a) Antennal joint 2 distinctly much longer, subequal to 3 and nearly or sometimes even a little more than half length of 1; pale scaling on body with more white ones in both sexes and less yellowish or chrome yellow ones; that in front and on sides of thorax and sides of abdomen more whitish or entirely white; that on at least sides of tergites 1 and 2 in both sexes and sometimes on others to a variable extent and sometimes in ♀ all the pale bands cretaceous or pearly whitish; dark scaling on abdomen above more dark bluish or violaceous, distinctly more extensive, the dark bands being much broader in both sexes, extending to near apex where dark or black spots are much larger or broader; venter entirely or predominantly cretaceous whitish-scaled; white scaling on hind tibiae tending to be usually less extensive, not extending much beyond middle; front femora in ♂ with some distinct longish hairs basally below; apical cross vein of discoidal cell less bulging, less sharply bent towards apex of first posterior cell; trochanters and sometimes hind margins of tergites reddish to a variable extent. ♂ ♀ *cyanolepida* Hesse and forms of it
- (b) Antennal joint 2 distinctly and relatively shorter, shorter or much shorter than 3 and usually distinctly or much less than half length of 1; pale scaling on thorax and abdomen more distinctly yellowish or chrome or orange yellowish, or with more extensive yellowish ones, only those on sides of abdomen basally on tergite 1 being pearly white; dark scaling on abdomen above less extensive, more black, or blackish brown, duller, less purplish, the dark bands relatively narrower, more spot-like, the spots on extreme sides and in apical part above much smaller, the chrome or orange yellowish scaling being more extensive in both sexes; scaling on venter usually more creamy yellowish to distinctly chrome yellowish, even if only towards apex; white scaling on hind tibiae usually reaching apex; front femora in ♂ without distinct and conspicuous hairs basally below, or with only feeble ones or with a spine; apical part of discoidal cell distinctly more bulging, more sharply bent at or almost at right angles towards apex of first posterior cell; trochanters and hind margins of tergites not reddish. 6
- 6 (a) Spot-like infuscations on cross veins in wings very faint or less conspicuous, only the middle cross vein and vein at base of second submarginal cell being darker or infuscated; anterior darker or more yellowish half of wings less sharply demarcated from clearer or less tinged hinder part; apical part of discoidal cell distinctly less rapidly or sharply bent upwards; scaling on venter distinctly more creamy yellow to yellow or with yellow ones towards apex. ♂ ♀ *australis* Hesse
- (b) Wings distinctly spotted, with at least 3 distinct, large, conspicuous, rounded, blackish spots on middle cross vein, basal cross vein of second submarginal cell and at apex of discoidal cell, and smaller infuscations at bases of second posterior, third posterior and discoidal cells respectively; anterior darker or more yellowish half of wings more sharply demarcated from less tinged hinder part; apical part of discoidal cell distinctly more rapidly or sharply bent upwards at right angles; scaling on venter mainly or entirely pearly or snow white. ♂ ♀ *punctipennis* Bezz.
- 7 (a) Antennal joint 2 scarcely or only a little shorter than 3; joint 3 ending in a very long, attenuated, spine-like style; joint 1 with more whitish or greyish-gleaming or white scales above; apical vein of discoidal cell less rapidly bent upwards;

bristly hairs lower down on occiput yellowish brown to brownish and those on hind coxae with some dark ones or entirely dark; white scaling on abdomen arranged as a broad basal spot on each side basally and broad transverse bands across the segments on each side (each occupying apical margin or apical half of tergites and narrow base of the following tergite), and also in a central row of basal spots or patches on tergites; hind tibiae with white scaling in basal half; interocular space on vertex in ♀ broader, subequal in length to the rather longer antennal joint 2; bulkier and larger species, reaching a length of 8 mm.

- ♂ ♀ *crocisops* Hesse
 (b) Antennal joint 2 much shorter, much shorter than 3; joint 3 less attenuated apically, ending in a much shorter spine-like style; joint 1 without any or with much fewer pale-gleaming or white scales; apical vein of discoidal cell distinctly more rapidly bent up at right angles; bristly hairs on occiput pale or whitish and bristles on hind coxae white; white scaling on abdomen arranged in elongated oblique patches or bars on each side of tergites, each beginning at the base of each tergite and extending obliquely down to hind border to fuse with the white scaling across the hind margin on each side, and also in a central row of basal subtriangular spots on tergites; hind tibiae mainly or entirely dark-scaled; interocular space in ♀ relatively narrower, subequal in length to the relatively shorter antennal joint 2; more slender and smaller species, not much more than 6 mm. long ♂ ♀ *obliquisquamosa* Hesse

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